146 Subpart D—Criteria and Standards Applicable to Class III Wells

§ 146.31 Applicability.

This subpart establishes criteria and standards for underground injection control programs to regulate Class III wells.

Reg	Permit Section/Fact Sheet/Permit App Section
§ 146.32 Construction requirements. (a) **All new Class III wells shall be cased and cemented to prevent the migration of fluids into or between underground sources of drinking water.** The Director may waive the cementing requirement for new wells in existing projects or portions of existing projects where he has substantial evidence that no contamination of underground sources of drinking water would result. **The casing and cement used in the construction of each newly drilled well shall be designed for the life expectancy of the well.** In determining and specifying casing and cementing requirements, the following factors shall be considered: (1) Depth to the injection zone; (2) Injection pressure, external pressure, internal pressure, axial loading, etc.; (3) Hole size; (4) Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification, and construction material); (5) Corrosiveness of injected fluids and formation fluids; (6) Lithology of injection and confining zones; and (7) Type and grade of cement.	Part V, Section C Well Casing and Cement a. c. **Fact Sheet 7.7.1 Thermoplastic Well Casing Variance Request** Waiver from thermoplastic casing for well >500 feet deep (discussed in Fact Sheet) **Fact Sheet 7.7.3 Hydraulic Collapse Pressure Calculations** Permit Part V, Section B.4 C.2 Well Casing Requirements Table 7 - Well Casing Dimensions for SDR 17 C.1.d Well Casing and Cement The well casing, injection pipe and cement shall be chemically compatible with the injectate and formation fluids. Nothing addressing lithology of injection & confining zone because they do not influence well construction requirements in this case. C.4 Well Cementing Requirements.
(b) Appropriate logs and other tests shall be conducted during the drilling and construction of new Class III wells.	Part V A.1. Well Logging The logs listed in Table 6 shall be conducted during or after the drilling of all wellfield injection, production and monitoring wells.

A descriptive report interpreting the results of such logs and tests shall be prepared by a knowledgeable log analyst and submitted to the Director. The logs and tests appropriate to each type of Class III well shall be determined based on the intended function, depth, construction and other characteristics of the well, availability of similar data in the area of the drilling site and the need for additional information that may arise from time to time as the construction of the well progresses. Deviation checks shall be conducted on all holes where pilot holes and reaming are used, unless the hole will be cased and cemented by circulating cement to the surface. Where deviation checks are necessary they shall be conducted at sufficiently frequent intervals to assure that vertical avenues for fluid migration in the form of diverging holes are not created during drillings.	A descriptive report interpreting the results of such logs shall be prepared by a knowledgeable log analyst and submitted to the Director as part of the well construction report required in Section D of this Part. The only tests needed are the MITs Appropriate logs are listed in Part V, A Table 6 - Well Drillhole Logging Program Part V A.2. Note: The cementing will be done by circulating cement to the surface, so deviation checks should not be needed in general.
(c) Where the injection zone is a formation which is naturally water-bearing the following information concerning the injection zone shall be determined or calculated for new Class III wells or projects: (1) Fluid pressure; (2) Fracture pressure; and (3) Physical and chemical characteristics of the formation fluids.	Part II, E Formation Testing Water level measurements provide the fluid pressure Measured again in Part VIII, B.2 Confirmation of Aquifer Baseline Potentiometric Surface to provide baseline for measuring cone of depression to demonstrate hydraulic control once wellfield operation begins. Part V, Section B No water chemistry requirements for injection interval within the wellfield, just for the downgradient injection zone perimeter monitoring wells or the alternative downgradient compliance boundary monitoring wells (Part IV)
(d) Where the injection formation is not a water-bearing formation, the information in paragraph (c)(2) of this section must be submitted.	Not applicable
(e) Where injection is into a formation which contains water with less than 10,000 mg/l TDS monitoring wells shall be completed into the injection	Part II, Section D. Design of

zone and into any underground sources of drinking water above the injection zone which could be affected by the mining operation. These wells shall be located in such a fashion as to detect any excursion of injection fluids, process by-products, or formation fluids outside the mining area or zone. If the operation may be affected by subsidence or catastrophic collapse the monitoring wells shall be located so that they will not be physically affected.	Wellfield Monitoring Well System NA no subsidence will occur
(c) Where injection is into a formation which does not contain water with less than 10,000 mg/l TDS, no monitoring wells are necessary in the injection stratum.	Not applicable
(d) Where the injection wells penetrate an USDW in an area subject to subsidence or catastrophic collapse an adequate number of monitoring wells shall be completed into the USDW to detect any movement of injected fluids, process by-products or formation fluids into the USDW. The monitoring wells shall be located outside the physical influence of the subsidence or catastrophic collapse.	Not applicable – no subsidence expected
(e) In determining the number, location, construction and frequency of monitoring of the monitoring wells the following criteria shall be considered: (1) The population relying on the USDW affected or potentially affected by the injection operation; (2) The proximity of the injection operation to points of withdrawal of drinking water; (3) The local geology and hydrology; (4) The operating pressures and whether a negative pressure gradient is being maintained; (5) The nature and volume of the injected fluid, the formation water, and the process by-products; and (6) The injection well density.	Part II, D. Design of Wellfield Monitoring Well System Part II C.7 Wellfield Pump Test Design & Construction 7. Water Supply Wells within ¼ mile of the perimeter monitoring well ring Part IX, B.3 Operational Groundwater Monitoring
§ 146.33 Operating, monitoring, and reporting requirements. (a) *Operating requirements.* Operating requirements prescribed shall, at a minimum, specify that: (1) Except during well stimulation injection pressure at the wellhead shall be calculated so as to assure that the pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures in the injection zone. In no case, shall injection pressure initiate fractures in the confining zone or cause the migration of injection or formation fluids into an underground source of drinking water. (2) Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.	Part V.B Calculation of fracture pressure Part VIII , D. Injection Pressure Limitation Part VIII, A. Injection between the outermost casing protecting USDWs and the well bore is prohibited.
(b) *Monitoring requirements.* Monitoring requirements shall, at a minimum, specify:	

(1) Monitoring of the nature of injected fluids with sufficient frequency to yield representative data on its characteristics. Whenever the injection fluid is modified to the extent that the analysis required by §146.34(a)(7)(iii) is incorrect or incomplete, a new analysis as required by §146.34(a)(7)(iii) shall be provided to the Director. (2) Monitoring of injection pressure and either flow rate or volume semi-monthly, or metering and daily recording of injected and produced fluid volumes as appropriate. (3) Demonstration of mechanical integrity pursuant to §146.08 at least once every five years during the life of the well for salt solution mining. (4) Monitoring of the fluid level in the injection zone semi-monthly, where appropriate and monitoring of the parameters chosen to measure water quality in the monitoring wells required by §146.32(e), semi-monthly. (5) Quarterly monitoring of wells required by §146.32(g). (6) All Class III wells may be monitored on a field or project basis rather than an individual well basis by manifold monitoring. Manifold monitoring may be used in cases of facilities consisting of more than one injection well, operating with a common manifold. Separate monitoring systems for each well are not required provided the owner/operator demonstrates that manifold monitoring is comparable to individual well monitoring.	Part IX,B.1.e Note: Instead of this language, injectate will be monitored monthly which will fulfill this requirement Part IX,B.1.a injection pressure b. injection and production flow rates Part VII, G. Part IX, Table 10 14 DAY INTERVAL EXCURSION MONITORING DURING ISR OPERATION and Part IX, Section B.3.a N/A no subsidence Part V, G required equipment for manifold monitoring Part VIII, D.4. Demonstration that Manifold Monitoring is Comparable to Individual Well Monitoring
§ 146.8 Mechanical integrity (2) One of the following methods must be used to determine the absence of significant fluid movement under paragraph (a)(2) of this section: (3) For Class III wells where the nature of the casing precludes the use of the logging techniques prescribed at paragraph (c)(1) of this section, cementing records demonstrating the presence of adequate cement to prevent such migration; (4) For Class III wells where the Director elects to rely on cementing records to demonstrate the absence of significant fluid movement, the	Permit Part VII, Table 9, Sections C & D Part VII, D. Well Construction Report Part V, E says "The well construction report shall document the adequacy of casing and cementing to prevent USDW contamination through vertical movement of fluids through the well annulus. The report shall contain information as to how the Permittee met the cementing requirements in Part V, Section D.4. Remedial cementing may be required if documentation of cementing requirements are inadequate as a demonstration of external mechanical integrity." Addressed in Part II, Section D with the design of the monitoring

monitoring program prescribed by §146.33(b) shall be designed to verify the absence of significant fluid movement.	system for the pump test. Monitoring wells are installed before the wellfield pump test and are used as observation wells during the wellfield pump test. Also stated in Monitoring Section Part IX, Section A.1
§144.55 Corrective action. **(a) *Coverage*.** Applicants for Class I, II, (other than existing), or III injection well permits shall identify the location of all known wells within the injection well's area of review which penetrate the injection zone, For such wells which are improperly sealed, completed, or abandoned, the applicant shall also submit a plan consisting of such steps or modifications as are necessary to prevent movement of fluid into underground sources of drinking water ("corrective action"). Where the plan is adequate, the Director shall incorporate it into the permit as a condition. Where the Director's review of an application indicates that the permittee's plan is inadequate (based on the factors in §146.07), the Director shall require the applicant to revise the plan, prescribe a plan for corrective action as a condition of the permit under paragraph (b) of this section, or deny the application. The Director may disregard the provisions of §146.06 (Area of Review) and §146.07 (Corrective Action) when reviewing an application to permit an existing Class II well. **(b) Requirements, (4) Class III wells only**. When setting corrective action requirements the Director shall consider the overall effect of the project on the hydraulic gradient in potentially affected USDWs, and the corresponding changes in potentiometric surface(s) and flow direction(s) rather than the discrete effect of each well. If a decision is made that corrective action is not necessary based on the determinations above, the monitoring program required in §146.33(b) shall be designed to verify the validity of such determinations.	Class III Permit Application 4.0 ATTACHMENT C - CORRECTIVE ACTION PLAN AND WELL DATA Part III, B.4
(c) *Reporting requirements*. Reporting requirements shall, at a minimum, include: (1) Quarterly reporting to the Director on required monitoring; (2) Results of mechanical integrity and any other periodic test required by the Director reported with the first regular quarterly report after the completion of the test; and (3) Monitoring may be reported on a project or field basis rather than individual well basis where manifold monitoring is used.	Part IX, F. Reporting Requirements 1.a & 6. Quarterly Monitoring Reports 1.b & 5. MITs 1.c
§ 146.34 Information to be considered by the Director. This section sets forth the information which must be considered by the Director in authorizing Class III wells. Certain maps, cross sections, tabulations of wells within the area of review, and other data may be included in the application by reference provided they are current, readily available to the Director (for example, in the permitting agency's files) and sufficiently identified to be retrieved. In cases where EPA issues the	

permit, all the information in this section must be submitted to the Administrator.	
(a) Prior to the issuance of a permit for an existing Class III well or area to operate or the construction of a new Class III well the Director shall consider the following:	
(1) Information required in 40 CFR 144.31 and 144.31(g); **Subpart D—Authorization by Permit** **144.31** Application for a permit; authorization by permit. (a) *Permit application.* (b) *Who applies?* (c) *Time to apply.* (d) *Completeness.* The Director shall not issue a permit before receiving a complete application for a permit except for emergency permits. An application for a permit is complete when the Director receives an application form and any supplemental information which are completed to his or her satisfaction. **The completeness of any application for a permit shall be judged independently of the status of any other permit application or permit for the same facility or activity.** For EPA administered programs, an application which is reviewed under § 124.3 is complete when the Director receives either a complete application or the information listed in a notice of deficiency.	Evaluation relative to Subpart W requirements
(e) *Information requirements.* All applicants for Class I, II, III, and V permits shall provide the following information to the Director, using the application form provided by the Director. Applicants for Class VI permits shall follow the criteria provided in § 146.82 of this chapter. (1) The activities conducted by the applicant which require it to obtain **permits** under RCRA, UIC, the National Pollution Discharge Elimination system (NPDES) program under the Clean Water Act, or the Prevention of Significant Deterioration (PSD) program under the Clean Air Act.	Evaluation relative to Subpart W requirements
(2) Name, mailing address, and location of the facility for which the application is submitted. (3) Up to four SIC codes which best reflect the principal products or services provided by the facility. (4) The operator's name, address, telephone number, ownership status, and status as Federal, State, private, public, or other entity. (5) Whether the facility is located on Indian lands. (6) A listing of all permits or **construction approvals** received or applied for under any of the following programs: (i) Hazardous Waste Management program under RCRA. (ii) UIC program under SDWA. (iii) NPDES program under CWA. (iv) Prevention of Significant Deterioration (PSD) program under the Clean Air Act. (v) Nonattainment program under the Clean Air Act. (vi) **National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act.** (vii) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act.	Evaluation relative to Subpart W requirements

(viii) Dredge and fill permits under section 404 of CWA. (ix) Other relevant environmental permits, including State permits.	
(7) A topographic map (or other map if a topographic map is unavailable) extending one mile beyond the property boundaries of the source depicting the facility and each of its intake and discharge structures; each of its hazardous waste treatment, storage, or disposal facilities; each well where fluids from the facility are injected underground; and those wells, springs, and other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant within a quarter mile of the facility property boundary.	Permit application Plate 3.1 with AOR extending 1.2 miles from project boundary. Wellfield maps and aquifer exemption boundary included in Permit application Figure 17.1
(8) A brief description of the nature of the business.	Permit Application Section 18.0 ATTACHMENT U - DESCRIPTION OF BUSINESS
(9) For EPA-administered programs, the applicant shall identify and submit on a list with the permit application the names and addresses of all owners of record of land within one-quarter mile of the facility boundary. This requirement may be waived by the Regional Administrator where the site is located in a populous area and the Regional Administrator determines that the requirement would be impracticable.	Information submitted on Feb 3, 2014 Dewey-Burdock Project Class III and Class V UIC Permits Notices of Intent to Apply for Permits Delivered to Owners of Record within ¼ Mile Green cards indicate the notices were sent in Oct & Nov, 2012. The info just didn't get sent to us till Feb 2014.
(10) A plugging and abandonment plan that meets the requirements of §146.10 of this chapter and is acceptable to the Director.	Permit Application Section 15.0 ATTACHMENT Q - PLUGGING AND ABANDONMENT PLAN
(f) *Recordkeeping.* Applicants shall keep records of all data used to complete permit applications and any supplemental information submitted under § 144.31 for a period of at least 3 years from the date the application is signed.	Permit requirement Part IX, Section A Record Retention
(g) *Information Requirements for Class I Hazardous Waste Injection Wells Permits.*	Not applicable
§ 146 34 Information to be considered by the Director. (a) Prior to the issuance of a permit for an existing Class III well or area to operate or the construction of a new Class III well the Director shall consider the following: (2) A map showing the injection well or project area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name and location of all existing producing wells, injection wells, abandoned wells, dry holes, public water systems and water wells. The map may also show surface bodies of waters, mines (surface and subsurface), quarries and other pertinent surface features including residences and roads, and faults if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.	Permit application Plate 3.1
(3) A tabulation of data reasonably available from public records or otherwise known to the applicant on wells within the area of review included on the map required under paragraph (a)(2) of this section which	Permit application Appendix A & Appendix B

penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and completion, and any additional information the Director may require. In cases where the information would be repetitive and the wells are of similar age, type, and construction the Director may elect to only require data on a representative number of wells.	
(4) Maps and cross sections indicating the vertical limits of all underground sources of drinking water within the area of review, their position relative to the injection formation, and the direction of water movement, where known, in every underground source of drinking water which may be affected by the proposed injection:	Permit Application Plates 6.12 through 6.21 Figures 5.2 & 5.3 for injection zones Figure 4.9: for Beaver Creek & Pass Creek alluvium
(5) Maps and cross sections detailing the geologic structure of the local area;	Permit Application Plates 6.12 through 6.22
(6) Generalized map and cross sections illustrating the regional geologic setting;	Figure 5.1 – cross section Maps Plates 23 & 24
(7) Proposed operating data: (i) Average and maximum daily rate and volume of fluid to be injected; (ii) Average and maximum injection pressure; and (iii) Qualitative analysis and ranges in concentrations of all constituents of injected fluids. The applicant may request Federal confidentiality as specified in 40 CFR part 2. If the information is proprietary an applicant may, in lieu of the ranges in concentrations, choose to submit maximum concentrations which shall not be exceeded. In such a case the applicant shall retain records of the undisclosed concentrations and provide them upon request to the Director as part of any enforcement investigation.	Table 7.1: Typical Project-Wide Injection Flow Rates Corresponding to Maximum Anticipated Gross Pumping Rates Figure 7.1: Typical Project-wide Flow Rates during Uranium Recovery and Aquifer Restoration Section 7.2 Injection Pressure Table 7.2: Typical Lixiviant Chemistry
(8) Proposed formation testing program to obtain the information required by §146.32(c): Where the injection zone is a formation which is naturally water-bearing the following information concerning the injection zone shall be determined or calculated for new Class III wells or projects: (1) Fluid pressure; (2) Fracture pressure; and	Part II, E Formation Testing Water level measurements provide the fluid pressure Measured again in Part VIII, 8.2 Confirmation of Aquifer Baseline Potentiometric Surface to provide baseline for measuring cone of depression to demonstrate hydraulic control once wellfield operation begins.

(3) Physical and chemical characteristics of the formation fluids.	Part V, Section B No water chemistry requirements for injection interval within the wellfield, just for the downgradient injection zone perimeter monitoring wells or the alternative downgradient compliance boundary monitoring wells (Part IV)
(9) Proposed stimulation program;	Not applicable
(10) Proposed injection procedure;	Class III Permit Application Section 10
(11) Schematic or other appropriate drawings of the surface and subsurface construction details of the well;	Class III Permit Application Figures 11.1, 11.2 & 11.3 Plate7.2 Typical Header House
(12) Plans (including maps) for meeting the monitoring requirements of §146.33(b);	Class III Permit Application Section 14 Plate7.1 Typical Wellfield Layout
(13) Expected changes in pressure, native fluid displacement, direction of movement of injection fluid;	Class III Permit Application Section 17.6.5 Hydraulic Well Field Control
(14) Contingency plans to cope with all shut-ins or well failures so as to prevent the migration of contaminating fluids into underground sources of drinking water;	Class III Permit Application Section 13
(15) A certificate that the applicant has assured, through a performance bond, or other appropriate means, the resources necessary to close, plug, or abandon the well as required by 40 CFR 144.52(a)(7) and	Class III Permit Part XIII
(16) The corrective action proposed to be taken under 40 CFR 144.55.	Class III Permit Part III
(b) Prior to granting approval for the operation of a Class III well the Director shall consider the following information:	
(1) All available logging and testing data on the well;	Class III Permit Part V, A
(2) A satisfactory demonstration of mechanical integrity for all new wells and for all existing salt solution wells pursuant to §146.08;	Class III Permit Part VII, E. Reporting Results of Initial Mechanical Integrity Demonstrations
(3) The anticipated maximum pressure and flow rate at which the permittee will operate;	Part V.B Calculation of fracture pressure Class III Permit Application Figure 7.1: Typical Project-wide Flow Rates during Uranium Recovery and Aquifer Restoration
(4) The results of the formation testing program;	Permit Part II, H.11
(5) The actual injection procedures; and	Permit Part II, H 1 – 4

	Vertical & horizontal delineation of injection zone, locations of injection and production wells Part V, Figure 3, 4, 5 showing well design and wellhead equipment Part V, Section G. 2. Wellhead and Surface Equipment Figure 6. Injection Header Instrumentation Figure 7. Injection Well Header Detail Part VIII Operating Requirements
(6) The status of corrective action on defective wells in the area of review.	Permit Part II, H.9 & 10
(c) Prior to granting approval for the plugging and abandonment of a Class III well the Director shall consider the following information:	Review of P&A Plan
(1) The type and number of plugs to be used;	Part X, C.1 Bentonite grout if its weight is greater than the bottomhole pressure in the well from bottom of well to within 8 ft of ground surface. If the well is being plugged by making a tight connection to the top of the casing and pumping the grout in under pressure, bentonite cannot be used. Otherwise use cement grout Cement grout from 8 ft bgs to 3 ft bgs
(2) The placement of each plug including the elevation of the top and bottom;	Part X, C.1 bentonite or cement grout from bottom of well to within 8 ft of ground surface Cement grout from 8 ft bgs to 3 ft bgs
(3) The type, grade, and quantity of cement to be used;	Part X, C.1 bentonite grout if its weight is greater than the bottomhole pressure in the well. Otherwise, cement grout.
(4) The method of placement of the plugs; and	Part X, C.1 circulate cement from bottom of well top unless a pipe cannot be placed to the bottom of the well. If a pipe cannot be lowered inside the well casing to place grout from the bottom to the top, the well may be plugged by making a tight connection to the top of the casing and pumping a volume of cement grout, sufficient to fill the well, under pressure into the well.
(5) The procedure to be used to meet the requirements of §146.10(c).	This refers to Class V wells. Not sure what this means.

§ 146.10 Plugging and abandoning Class I, II, III, IV, and V wells.	
(a) Requirements for Class I, II and III wells. (1) Prior to abandoning Class I, II and III wells, the well shall be plugged with cement in a manner which will not allow the movement of fluids either into or between underground sources of drinking water. The Director may allow Class III wells to use other plugging materials if the Director is satisfied that such materials will prevent movement of fluids into or between underground sources of drinking water.	Part X, B
(4) The plugging and abandonment plan required in 40 CFR 144.51(o) and 144.52(a)(6) shall, in the case of a Class III project which underlies or is in an aquifer which has been exempted under §146.04, also demonstrate adequate protection of USDWs. The Director shall prescribe aquifer cleanup and monitoring where he deems it necessary and feasible to insure adequate protection of USDWs.	Part IV Post-Restoration Monitoring Plan Part IX, D Post-Restoration Groundwater Monitoring

§147.2101 EPA-administered program--Class I, III, IV and V wells and all wells on Indian lands. (a) Contents. The UIC program for all Class I, III, IV, and V wells, including those on Indian lands, and for Class II wells on Indian lands in the state of South Dakota is administered by EPA. This program consists of the UIC program requirements of 40 CFR parts 124, 144, 146, 148, and any additional requirements set forth in the remainder of this subpart. Injection well owners and operators, and EPA shall comply with these requirements. (b) Effective date. The effective date of the UIC program for Class I, III, IV and V wells on all lands in South Dakota, including Indian lands, and for Class II wells on Indian lands only, is December 30, 1984	
§147.2102 Aquifer exemptions. (a) This section identifies any aquifers or their portions exempted in accordance with §§144.7(b) and 146.4 of this chapter at the time of program promulgation. EPA may in the future exempt other aquifers or their portions, according to applicable procedures, without codifying such exemptions in this section. An updated list of exemptions will be maintained in the Regional office. (b) Those portions of all aquifers located on Indian Lands, which meet the definition of USDW and into which existing Class II wells are injecting, are exempted within a $\frac{1}{4}$-mile radius of the well for the purpose of Class II injection activities only.	
§147.2103 Existing Class II enhanced recovery and hydrocarbon storage wells authorized by rule.	
§147.2104 Requirements for all wells.	
(a) The owner or **operator converting an existing well to an injection well** shall check the condition of the casing with one of the following logging tools; (1) A pipe analysis log; or (2) A caliper log.	
(b) The owner or operator of a new injection well cased with plastic (PVC, ABS, or others) casings shall: **(1)** Not construct a well deeper than 500 feet; (2) Use cement and additives compatible with such casing material; and (3) Cement the annular space above the injection internal from the bottom of the blank casing to the surface.	Variance Discuss in Fact Sheet Ask Lucita: can (c)(4) apply to (b) to allow us to accept a variance?
(c) The owner or operator of a newly drilled well shall install centralizers as directed by the Regional Administrator.	Part V, Section D.3 Centralizer requirement – as needed, minimum of two. See NMA example GEIS. Figure for well construction show 100' ft max between casing centralizers. Talk to Powertech about this. Did I put this in the permit?

(d) The owner or operator shall as required by the Regional Administrator: (1) Protect USDWs by: **(i)** Setting surface casing 50 feet below the lowermost USDW; **(ii)** Cementing surface casing by recirculating the cement to the surface from a point 50 feet below the lowermost USDW; or **(iii)** Isolating all USDWs by placing cement between the outermost casing and the well bore; and	
(2) Isolate any injection zones by placing sufficient cement to fill the calculated space between the casing and the well bore to a point 250 feet above the injection zone; and	
(3) **Use cement:** **(i)** Of sufficient quantity and quality to withstand the maximum operating pressure; and **(ii)** Which is resistant to deterioration from formation and injection fluids; and **(iii)** In a quantity no less than 120% of the calculated volume necessary to cement off a zone.	
(4) The Regional Administrator may approve alternate casing and cementing practices provided that the owner or operator demonstrates that such practices will adequately protect USDWs.	Ask Lucita again if this paragraph means we can deviate from
(e) Area of review. Notwithstanding the alternatives presented in §146.6 of this chapter, the area of review shall be a fixed radius as described in §146.6(b) of this chapter.	
(f) The applicant must give separate notice of intent to apply for a permit to each owner of record of the land within one-quarter mile of the site. The addresses of those to whom notice is given and the description of how notice was given shall be submitted with the permit application. The notice shall include:	
(1) The name and address of applicant; (2) A brief description of the planned injection activities, including well location, name and depth of the injection zone, maximum injection pressure and volume, and fluid to be injected; (3) The EPA contact person; and (4) A statement that opportunity to comment will be announced after EPA prepares a draft permit.	

This requirement may be waived by the Regional Administrator if he determines that individual notice to all land owners of record would be impractical.	